

**US Army Corps
of Engineers**
Jacksonville District

Five-Year Review Report

Kassouf-Kimerling Superfund Site Tampa, Hillsborough County, Florida

Prepared for
U.S. Environmental Protection Agency, Region IV
June 2004

10115928



EPA Five-Year Review Signature Cover

Preliminary Information

Site name 62 nd Street Site		EPA ID FLD980728877
Region 04	State Florida	City/County Tampa / Hillsborough, County
LTRA* (highlight) Y N		Construction completion date: June 13, 1995
Fund/PRP Lead PRP		NPL status Final
Lead agency EPA, Region 4		
Who conducted the review (EPA Region, state, Federal agencies or contractor) US Army Corps of Engineers, Jacksonville District		
Dates review conducted From 3/1/04 To 9/10/04		Date(s) of site visit 5/07/04
Whether first or successive review Second Review		
Circle: Statutory Review	Due date 9/10/04	
Trigger for this review (name and date)		
Recycling, reuse, redevelopment site (highlight) Y N		

Deficiencies: Breaches in security provided by the fencing and posting of the site were noted. These have not progressed to a level that would impact the effectiveness of the remedy. See attached report Section VIII Deficiencies.

Recommendations. Recommendations are listed in the attached report, Section IX Recommendations.

Protectiveness Statement(s): The remedy at the 62nd Street Superfund Site remains protective of human health and the environment at present.

Signature of EPA Regional Administrator or Division Director, and Date

Carl J. M. M. for 9/22/04
Signature Date

Winston A. Smith, Director
Name and Title

**Kassouf-Kimerling Superfund Site
Tampa, Hillsborough County, Florida
Five-Year Review Report**

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List of Abbreviations

ARAR	Applicable, or Relevant and Appropriate Requirements
COC	Contaminant of Concern
DNAPL	Dense Non Aqueous Phase Liquids
EPA	Environmental Protection Agency
ESD	Explanation of Significant Differences
ESE	Environmental Science & Engineering
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FS	Feasibility Study
K&K	Kassouf-Kimerling
NGVD	National Geodetic Vertical Datum
POTW	Publicly Owned Treatment Works
RA	Remedial Action
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SFS	Supplemental Feasibility Study
TI	Technical Impracticability
USACE	United States Army Corps of Engineers

Kassouf-Kimerling Superfund Site Tampa, Hillsborough County, Florida Five-Year Review Report

I. Introduction and Purpose

General

The U.S. Army Corps of Engineers (USACE), Jacksonville District, on behalf of the U S Environmental Protection Agency (EPA), Region 4, conducted a Five-Year Review of the remedial actions implemented at the Kassouf-Kimerling Superfund Site (also known as the 58th Street Landfill), Hillsborough County, Florida. This report documents the methods, findings, and conclusions of USACE's Five-Year Review and evaluates whether the remedial actions at the Kassouf-Kimerling Superfund Site remain protective of human health and the environment.

Authority

This review is required by statute. Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and Section 300 430 (f) (4) (ii) of the National Oil and Hazardous Substance Contingency Plan (NCP), which requires that periodic (no less than every five years) reviews be conducted for sites where hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure following the completion of remedial actions

This is the second five-year review for the Kassouf-Kimerling Site

II. Site Background

The background information presented in this section has been obtained from the Record of Decision (ROD) as well as numerous other reports. It is not the purpose of this section to present a detailed description of the site background, since this has already been accomplished in a number of reports.

A. Site Description

Location

The Kassouf-Kimerling is located in Hillsborough County, within Township 29S, Range 19E, Section 10, just north of Columbus Drive on the east side of 58th Street in Tampa, Florida. The Site is about 60 feet wide by 700 feet long and lies just east of 58th Street and west of the marsh separating the Site from Peninsular Fisheries. A

canal was cut through the landfill in the late 1970's and connects a marsh located west of 58th Street to the marsh just east of the Site

A Site geographic location map is presented as Figure 1 and Figure 2

Site Layout/Topography/Hydrology

The landfill material consists of rubber and plastic lead-acid battery casings covered by a thin layer of sand. The depth of the landfill material has been estimated to vary from 6.0 to 12.0 feet, with an estimated total fill volume of 11,350 cubic yards. The average elevation across the site, based on existing topographic information, is approximately 33.3 feet. The site, east of 58th Street, slopes generally east to southeast terminating in the marsh area east of the site.

Surface water flows from west to east through a culvert beneath 58th Street and a canal cut through the Landfill. Water is discharged from the eastern marsh through a series of drainage ditches leading to the Palm River to the east of the site. Surface drainage from the surrounding area flows into a lake located approximately 1,000 feet north of the site. The lake is a flooded borrow pit excavated during the construction of Interstate 4 (I-4 located northwest of the site). A berm separates the lake from the marsh area to the south. During periods of excess surface water runoff, water overflows the berm and flows in a southeasterly direction into the marsh areas east of the site.

A small lake exists on the west side of 58th Street, approximately 200 feet from the site. A canal was excavated connecting this lake to the west end of the culvert running beneath 58th Street to promote drainage. The canal then was extended from the east end of the culvert, through the landfill materials, to intersect the marsh east of the site.

A Site layout map is presented in Figure 3.

B. Site Chronology

History of Operations

Battery casings were disposed at the site in the fall of 1978 after peat deposits were excavated. Based on aerial photography review, 58th Street Landfill was constructed across the marsh sometime prior to 1976. The culvert, designed to permit surface water flow beneath 58th Street, may have been installed at that time. Shortly after the casings were disposed, a canal was dug connecting the small lake west of 58th Street with the western edge of the marsh east of the site. The depth of the fill material varied across the site from six to twelve feet.

The site is currently vacant and access is restricted by fencing and locked gates

III. Results of Site Investigations

A. General

Pre-NPL Listing (1981)

The initial water quality studies evaluation of the site was conducted by several regulatory agencies (FDER and Hillsborough County Health Department), and a Mitre Model evaluation was conducted by Florida Department of Environmental Regulations (FDER) in 1981.

The results of site investigations conducted prior to NPL listing in October 1981 are summarized in the Record of Decision (ROD's), signed on March 31, 1989 (for the remediation of the landfill area) and March 30, 1990 (for the remediation of the wetlands). In general, these early investigations resulted in the following

- Geraghty and Miller conducted a groundwater and surface water investigation in the Fall of 1981 during which four shallow monitoring wells were installed and sampled together with five surface water locations.
- Identification of the presence of elevated levels of arsenic, cadmium, and lead in the groundwater and surface water at the Kassouf-Kimerling site.

Information gathered during these early investigations resulted in National Priorities Listing (NPL) of the site in 1982

NPL Listing (1982) to ROD's Signing (1989/90)

In September 1985, ERM-South performed the Remedial Investigation/ Feasibility Study (RI/FS), which included geophysical investigations, soil boring and sampling, and groundwater and surface water sampling. These investigations identified contamination in the soils and surficial groundwater at the landfill as well as contamination in the surface water and sediments in the adjacent marsh. The RI/FS was completed in June 1988.

In July 1989, EPA conducted a post RI/FS investigation which focused on the surface water and sediments in the marsh.

Two ROD's were issued for the site by USEPA Region 4. On March 31, 1989, the first ROD, for the site designated as Operable Unit "OU-1", remediation of the landfill area, was executed on March 31, 1989. The second ROD, for the marsh/wetland

designated as OU-2 was executed on March 30, 1990 FDER (now FDEP) concurred with the two ROD's on April 17, 1990.

Based on these investigations, solidification was chosen by EPA for remediation of Operable Unit (OU-1) and the sediments of OU-2 because it is a cost effective proven technology, which will provide a permanent solution for remediation of the contamination present at the site.

POST-ROD CERCLA ACTIVITIES

In February 1991, the Consent Decree (CD),(Civil Action No 90-1587-CIU-T-10B) for the Kassouf-Kimerling Superfund Site was entered into between the United States of America and Gulf Coast Recycling, Inc

On June 12, 1991, OHM submitted a Remedial Design Work Plan (RDWP) to EPA. The RDWP was subsequently revised on September 5, 1991 and was finalized on October 31, 1991, based on EPA's comments.

On March 17, 1992, design studies were performed by OHM and Dames & Moore, Inc (under subcontract to OHM), and the Preliminary Design (30%) Report was submitted to EPA and comments received from EPA dated April 17, 1992.

On May 22, 1992, the Intermediate Design (60%) Report was submitted to EPA and comments received from EPA dated July 7, 1992.

On December 24, 1992 the Pre-final/Final design (90%/100%) Report was submitted to EPA and comments received from EPA on February 4, 1993.

The Final Design (100%) document was submitted to EPA on February 26, 1993 and will be implemented in accordance with the scope of work in the RAWP.

Risks to human health and the environment, the provisions of the ROD, and subsequent remedial actions will be covered in the following sections.

B. Contaminants of Concern

Contaminants of Concern (COC's) for the Kassouf-Kimerling Superfund Site are those contaminants commonly associated with car battery materials that may pose a threat to human health and the environment. Factors used in the RI and ROD for the selection of COC's were:

- frequency of detection
- fate and transport
- concentration

- toxicity

PRIMARY COC's

The primary contaminants of concern (COC) affecting the soil, ground water and surface water are:

- arsenic
- lead
- cadmium

C. Potential Pathways for Contaminant Migration and Exposure

- On-site Exposure Pathways to General Public
- Off-site Exposure Pathways to General Public
- Direct Ingestion of Aquatic Organisms
- Groundwater
- Environmental Receptors Exposure Pathways

IV. Summary of Response Actions

A. Remedial Objectives and Goals

The general remedial action objective for the K&K Site is to provide protection of human health and the environment, while complying with federal and state requirements or ARARs (ROD, EPA 1990)

The specific remedial action objectives and goals for the Kassouf-Kimerling site were defined in the Final Remedial Action Work Plan For The Kassouf-Kimerling Battery Disposal Site, Tampa, Florida Prepared by: OHM Remediation Services, Corp. and submitted to USEPA Region 4, February 26, 1993

B. Remedy Selection

General

EPA has nine criteria for judging the best alternative for providing for protection of human health and the environment. These nine criteria consist of five primary criteria, two threshold criteria, and two post-RI/FS criteria.

Primary Criteria,

- Short – Term Effectiveness,

- Long -Term Effectiveness,
- Implementability,
- Reduction of Toxicity, Mobility, or Volume;
- Cost;

Threshold Criteria;

- Compliance with ARARs,
- Overall Protection of Human Health and the Environment,

Post-RI/FS Criteria,

- State Acceptance,
- Community Acceptance,

Remedial action at the Kassouf-Kimerling Superfund Site was embodied in two separate Records of Decision (ROD's). The first ROD addressed the first operable unit (OU-1) remediation of the landfill area. The second ROD addressed the second operable unit (OU-2), remediation of the wetlands. The ROD for OU-1 was executed March 31, 1989. The ROD for OU-2 was executed March 30, 1990.

Seven remedial alternatives were considered in the ROD for OU-1. The remedy selected was solidification/chemical fixation and disposal on-site. This selected remedy was a modification of Alternative 7, chemical fixation with ground water treatment.

Regulations considered during the selection of a remedial alternative included RCRA, Clean Water Act, Safe Drinking Water Act, flood plain regulations and the Endangered Species Act.

All seven alternatives were evaluated on the basis of the degree to which they complied with relevant and appropriate requirements (ARAR's). Ground water and surface water standards for arsenic, cadmium and lead were the primary concern.

The ROD for OU-2 included:

- (1) Excavation and treatment by solidification of contaminated marsh sediments within twenty feet of the landfill;
- (2) Excavation and treatment by solidification of contaminated marsh sediments in the canal east of the site extending 150 feet from the landfill;
- (3) Allowing the remainder of the marsh sediments to remain in place without treatment, and altering the marsh such that it remains flooded year round; and
- (4) Mitigation to compensate for the wetlands that were adversely impacted.

impacted.

C. Remedial Action

The Final Remedial Action Plan was adopted by EPA and embodied in a Consent Decree dated February 1991. The Final Design Report for the Kassouf-Kimerling Superfund Site was submitted to EPA in February 1993.

The remedial objectives were to meet specific performance requirements found in various federal, state and local regulations, which applied to the site. A specific sediment clean-up goal of 40 mg/kg of lead had been selected for OU-2, however, a Wetland Impact Study, dated January 1990, concluded that attempting to achieve this clean-up goal in the sediment could result in the mobilization of lead. Therefore, the remainder of the marsh sediment was left in place and the hydroperiod of marsh was altered.

Remediation of OU-1 and OU-2 was completed in 1994. Mitigation of wetlands was completed in 1998.

Selected Remedy

- All of the alternatives carried through to the detailed analysis stage were evaluated using the nine criteria mentioned above. Based on this evaluation, EPA selected Alternative 7 as the preferred alternative to address contamination in the groundwater.
- According to the ROD, these alternatives will require extensive treatability studies during design before implementation of the remedy.

The technology selected by EPA, solidification, will be conducted on lead contaminated materials excavated from both OU's. This process will stabilize the lead contaminated soils and sediments in a solid monolith which will effectively encapsulate the contaminated material and prevent the leaching of contamination into the surrounding environment. Remediation of OU-1 addresses the source of the contamination, i.e., landfill wastes and contaminated underlying soils. Remediation of OU-2 addresses impacted marsh sediments to a depth of 2 feet within a 20-foot wide zone east of the landfill, and in the canal extending 150 feet east from the eastern edge of 58th Street. The remediation method of OU-1 and OU-2 is protective of human health and the environment since contaminants will be immobilized and the soil exposure pathway broken.

- Operable Unit One

The first Operable Unit addresses the source of the contamination by containing the landfill wastes and contaminated underlying soils. The selected method, as

discussed in EPA ROD dated March 31, 1989, is excavation, treatment by stabilization and placement of the treated material onsite. This includes the excavation of landfill materials, as determined by the presence of battery casings and any underlying soils exceeding EPA toxicity criteria for lead. The volume of the landfill waste has been estimated to be approximately 11,350 cubic yards, as calculated from the length, width, and reported average depth of the observed wastes at the site. Excavated landfill material and soils will be treated to meet specified criteria from the ROD's, as well as subsequent EPA-mandated performance specifications finalized on November 3, 1992, and placed within the landfill area.

- Operable Unit Two

The volume of marsh and canal sediments has been estimated to be approximately 1,260 cubic yards, as calculated from the length of the landfill. The marsh will be excavated to an approximate width of 20 feet and depth of 2 feet. The major components of OU-2 (the adjacent marsh and canal east of the site) remediation, as discussed in EPA's ROD dated March 30, 1990, include

- Excavation and treatment by stabilization of the upper 2 feet of marsh sediments within 20 feet east of the landfill and in the canal east of the site extending 150 feet east from 58th Street,
- Placement of treated wastes onsite with the treated landfill wastes from OU-1. Following excavation of OU-2, the excavated areas will be backfilled with clean fill material and subsequently revegetated,
- Redesign of the canal currently draining the marsh to allow the marsh to remain flooded year-round, and
- Mitigation to compensate for the marshes that have been potentially adversely impacted by the site. A waiver of the Federal Water Quality Criteria (FWQC) is required for the surface water adjacent to the site. Attempting to remediate the remainder of the marsh sediments (sediments in the marsh not treated by solidification) could result in greater risk to the environment by potential disturbance of the metals to a greater extent (CERCLA 121(d)(4)(B)).

The 1990 OU-2 ROD required mitigation of the wetlands (marsh) adjacent to the landfill at the Site. The ROD did not specify any particular requirements for mitigation, but it did require that mitigation work be performed in the adjacent marsh.

The area of the marsh impacted by the contamination from the landfill is owned by a private citizen. In an effort to carry out its obligation under the Consent Degree,

Gulf Coast Recycling, Inc. offered to buy the private citizen's property, but the citizen refused to sell it on any reasonable terms. Consequently, an alternate location for the wetlands mitigation was chosen. The McKay Bay Nature Park was proposed by EPA in February of 1994 through an Explanation of Significant Differences. Unfortunately, EPA and FDEP determined that the McKay Bay Site was unacceptable since the portions of McKay Bay that were proposed for wetlands mitigation were found to be contaminated.

EPA contacted Florida's SWIM program, which proposed Mobbly Bay as a suitable alternative area for conducting the mitigation project. After reviewing the SWIM design specifications for the Mobbly Bay enhancement and restoration, EPA decided that Mobbly Bay was an excellent substitute location for the implementation of the wetlands mitigation required in the OU-2 ROD. This substitution was formalized by the March 1997 Explanation of Significant Differences.

The 15 acre Mobbly Bay project area is located in Northern Tampa Bay (Old Tampa Bay) and is jointly owned by the City of Oldsmar and Pinellas County. The project area consists of several man-made open water ponds that were excavated several decades ago to fill adjacent lands for urban development. Actual restoration activities conducted by SEIM include: the enhancement of existing water features, creation enhancement of intertidal wetlands, and creation of mangrove-rimmed islands. More than six acres of intertidal habitat (wetlands) have been created and enhanced by this project.

Under the CD with EPA, GCR established a trust fund to ensure that the Site would have sufficient funds to conduct the Remedial Action, including the wetlands mitigation project. To date, all construction outlined in the OU-1 ROD has been completed. Also, all mitigation work in Mobbly Bay has been completed and satisfies the requirements of the OU-2 ROD. Both areas (on-site and off-site) have entered into the long-term maintenance phase of the Superfund process.

D. Operation and Maintenance

The O&M programs for the Kassouf-Kimerling Site are detailed in the following documents:

- 1999 Report Groundwater Sampling, Surface Water Sampling, and Landfill Inspection of Kassouf-Kimerling Site, Tampa, FL prepared by Qore Property Sciences, September 3, 1999
- 2000 Report Groundwater Sampling, Surface Water Sampling, and Landfill Inspection of Kassouf-Kimerling Site, Tampa, FL prepared by Qore Property Sciences, August 24, 2000
- 2001 Report Groundwater Sampling, Surface Water Sampling, and Landfill

Sciences, December 12, 2001

- 2002 Report Groundwater Sampling, Surface Water Sampling, and Landfill Inspection of Kassouf-Kimerling Site, Tampa, FL prepared by Qore Property Sciences, June 20, 2002

As part of this Five-year Review, the Groundwater Sampling Reports (September 1999, August 2000, December 2001 and June 2002 1999) were reviewed. These reports contain a brief description of the groundwater findings based upon the analytical data from a sampling event. These findings are listed as follows,

- The remedies selected for OU-1 and OU-2 at the Kassouf-Kimerling Site are still effective and continue to protect human health, welfare, and the environment.
- As documented in Tables 1-4 lead was not detected in any of the groundwater wells above the current groundwater standard of 0.015 mg/l.

Groundwater O&M

The groundwater monitoring O&M period began in 1998. During the first year, groundwater was monitored on a quarterly basis. Initially, collected samples were analyzed for pH, specific conductance, antimony, cadmium, and lead. The COC's Antimony and cadmium analyses have been dropped since results were always below detectable limits in all samples. See Tables 1-4.

During Years 2 through 4, annual monitoring is required and only analyzed for lead.

During sampling events conducted shortly after completion of remediation at the site, lead exceeded the current groundwater standard of 0.015 mg/l in at least one of the wells. Samples collected in more recent years reveal lead to be in compliance. Lead is also routinely detected in surface water sample SW-1, an upgradient location west of the landfill area.

Operation & Maintenance Costs

No O&M Costs were furnished for the Kassouf-Kimerling Site.

V. Summary of Site Visit and Findings

A. General

This Five-Year Review summary consists of the following activities; (1) interviews with the EPA Project Manager, Gulf Coast Recycling, Inc. Environmental Manager, (2) site inspection, (3) review of all relevant documents (also see Attachment's A &

(2) site inspection, (3) review of all relevant documents (also see Attachment's A & B), (4) preparation of the Five-Year Review report.

B. Interviews

Mr. Joe Alfano, EPA Region IV Remedial Project Manager (RPM)

Mr. Alfano was interviewed by phone and at the site documentation where information and documentation was gathered from the EPA Region IV file room in Atlanta, GA. In addition to facilitating the gathering of documentation, Mr. Alfano provided information on site history, remedial actions, and current site status

Ms. Joyce Morales-Caramella, Environmental Manager, Gulf Coast Recycling, Inc.

Ms. Morales-Caramella was interviewed by phone on May 3, 2004 shortly prior to the site inspection was completed on May 6th. Ms. Morales-Caramella has had extensive involvement with the site since the Gulf Coast Recycling Inc. acquired ownership of the Kassouf-Kimerling Site. Valuable information on site history, remedial actions, and current site status was obtained during the phone interview, and site visit. Ms. Morales-Caramella was not aware of any complaints or issues at the community level.

Mr. Paul Senkbeil, Environmental Technician, Gulf Coast Recycling, Inc.

Mr. Senkbeil was interviewed during the Kassouf-Kimerling Site inspection on May 6, 2004. Mr. Senkbeil provided site access and escorted site inspection team throughout the site inspection. Mr. Senkbeil was not aware of any complaints or issues at the community level.

C. Site Inspection

General

The Five-Year Review site inspection of the K&K Site was held on May 6, 2004.

The following individuals were in attendance during the inspection:

Olice Cater, USACE, Jacksonville District, Project Engineer
Joyce Morales-Caramella, Gulf Coast Recycling, Inc. Environmental Manager
Paul Senkbeil, Gulf Coast Recycling, Inc., Environmental Technician

The weir structures appeared to be in good condition and functioning as intended. Water was observed flowing over the weir. The marsh was flooded as required. The grass on the landfill cap appeared to be in good shape and recently mowed. The area adjacent to the marsh and the sloped sides of the landfill area looked good.

Photographs were taken during the initial visit and appear in Report .

The float switch was located in the marsh directly west of the augmentation well. The switch was actuated and the water was allowed to flow for approximately forty-eight hours to assure the pump was operating properly.

Site Security

The chains on both gates were locked. Locks on all four of the monitoring wells and the caps on the protective outer casings of two of the wells were in good shape.

D. Review of Applicable or Relevant and Appropriate Requirements (ARARs)

The ARAR's for the Kassouf-Kimerling Superfund Site are more stringent today than in 1989 when the ROD for OU-1 was issued. Groundwater quality standards for arsenic, cadmium and lead are presently 0.05 mg/l, 0.005 mg/l, and 0.015 mg/l respectively, compared with 0.05 mg/l, 0.01 mg/l and 0.05 mg/l in 1989. Surface water standards are also more stringent.

During the first year after remediation at the site was completed, groundwater monitoring was conducted quarterly. Initially, collected samples were analyzed for pH, specific conductance and antimony, cadmium and lead, the metals of concern. Antimony and cadmium were later dropped since results were always below detectable limits in all samples.

During sampling events conducted shortly after completion of remediation at the site, lead exceeded the current groundwater standard of 0.015 mg/l in at least one of the wells. Samples collected in more recent years reveal lead to be in compliance. Lead is also routinely detected in surface water sample SW-1, an up gradient location west of the landfilled area.

When the damage to wells KKFL-1 and KK8A was discovered on February 17, 1999, Qore Property Sciences (f.k a. Atlanta Testing & Engineering) was directed to collect samples from the two wells to determine if any foreign materials had been introduced into the wells. The collected samples were also analyzed for lead. Lead in both wells was below detectable limits.

An ARAR review was performed for the site in accordance with the draft EPA guidance document, "Comprehensive Five-Year Review Guidance," EPA 540R-98-050, April 1999.

VI. Assessment

Effectiveness of the Remedy.

The remedies for OU-1 and OU-2 at the Kassouf-Kimerling Superfund Site are still effective and continue to protect human health, welfare and the environment. Data collected from the monitoring wells indicate the contaminant concentrations are stable and in some wells have shown a decline

Effectiveness of the Remedy for Groundwater Remediation:

In addition, the groundwater contamination does not appear to pose any current threat to the environment or to human health at present, and should be concluded that the remedial groundwater objective has been met

Adequacy of O&M

O&M procedures at Kassouf-Kimerling mainly consist of minor repair of existing monitoring wells as needed. No significant O & M difficulties have occurred to date.

VII. Deficiencies

The following deficiencies were discovered during the Five-Year Review. These deficiencies are judged to be minor, and do not pose a threat to human health or the environment

- Flotation device to activate pump sometimes malfunctions
- North and South gates should be upgraded to fixed gates

VIII. Recommendations

The following recommendations are made to address the deficiencies noted above.

- A. Recommend annual monitoring at the site as designed.
- B. Recommend mowing of cap cover on an established schedule
- C. Recommend enforce site access and land use restrictions when necessary

IX. Protectiveness Statement

The remedy remains protective of human health and the environment. The groundwater collection system appears to be effective in containing the plume and removing contaminants. Institutional controls at the Kassouf-Kimerling Superfund Site remain in place and are effective.

X. Next Review

This is a policy review site that requires ongoing five-year reviews as long as hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure. EPA -Region 4 should conduct the next review within five years of the original due date of this report. The next five year review is due June 18, 2009.

Figures

Note These figures were taken from the following documents:

Figure 1 - Geographic Location Map: Final Remedial Action Work Plan For The Kassouf-Kimerling Battery Disposal Site, Tampa, FL, prepared by OHM Remediation Services Corp February 26, 1993

Figure 2 - Site Location Map: Final Remedial Action Work Plan For The Kassouf-Kimerling Battery Disposal Site, Tampa, FL, prepared by OHM Remediation Services Corp February 26, 1993

Figure 3 – Site Layout Map: 2002 Report Groundwater Sampling, Surface Water Sampling, and Landfill Inspection of Kassouf-Kimerling Site, Tampa, FL prepared by Qore Property Sciences, June 20, 2002

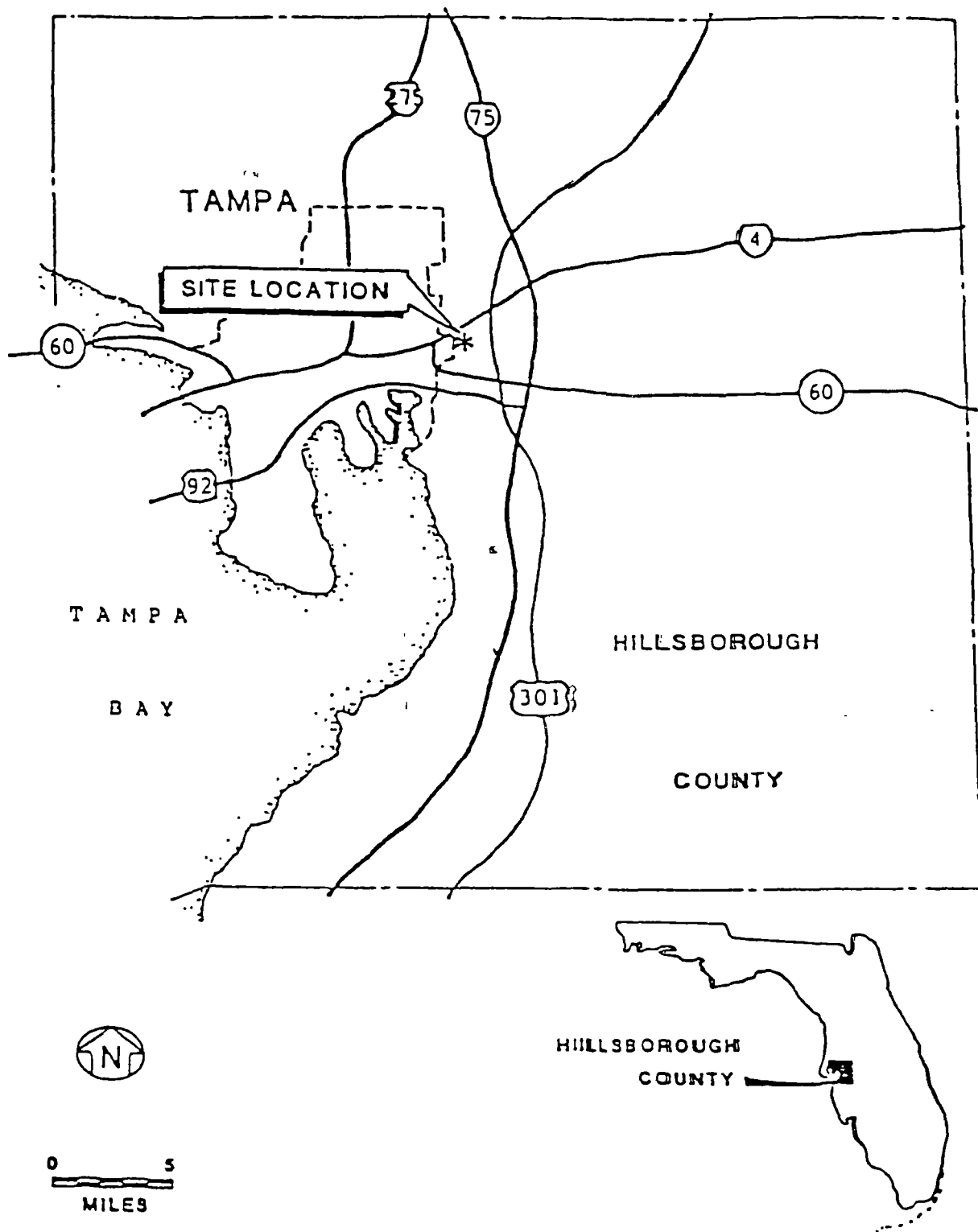


FIGURE 1
GEOGRAPHIC LOCATION MAP

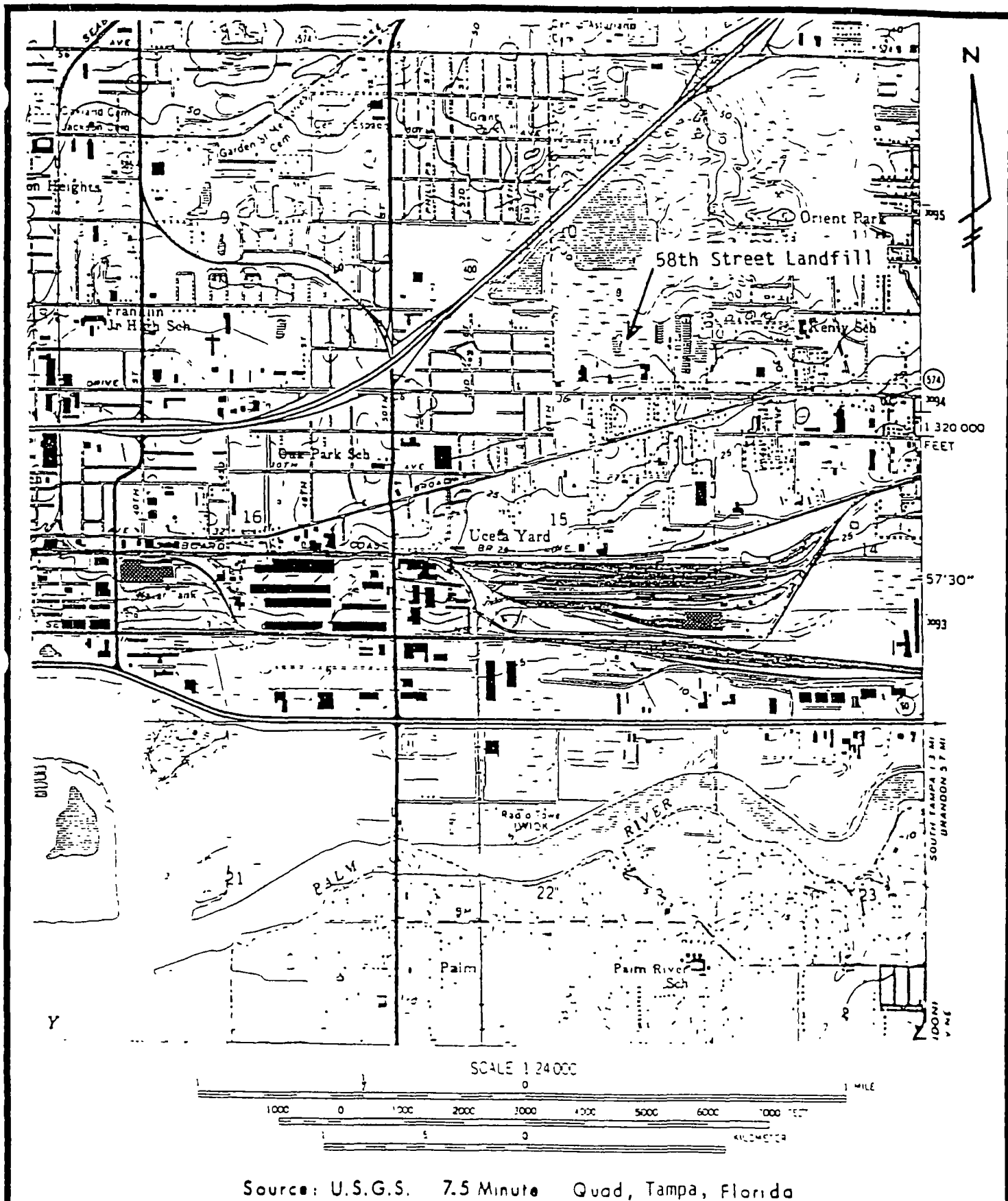
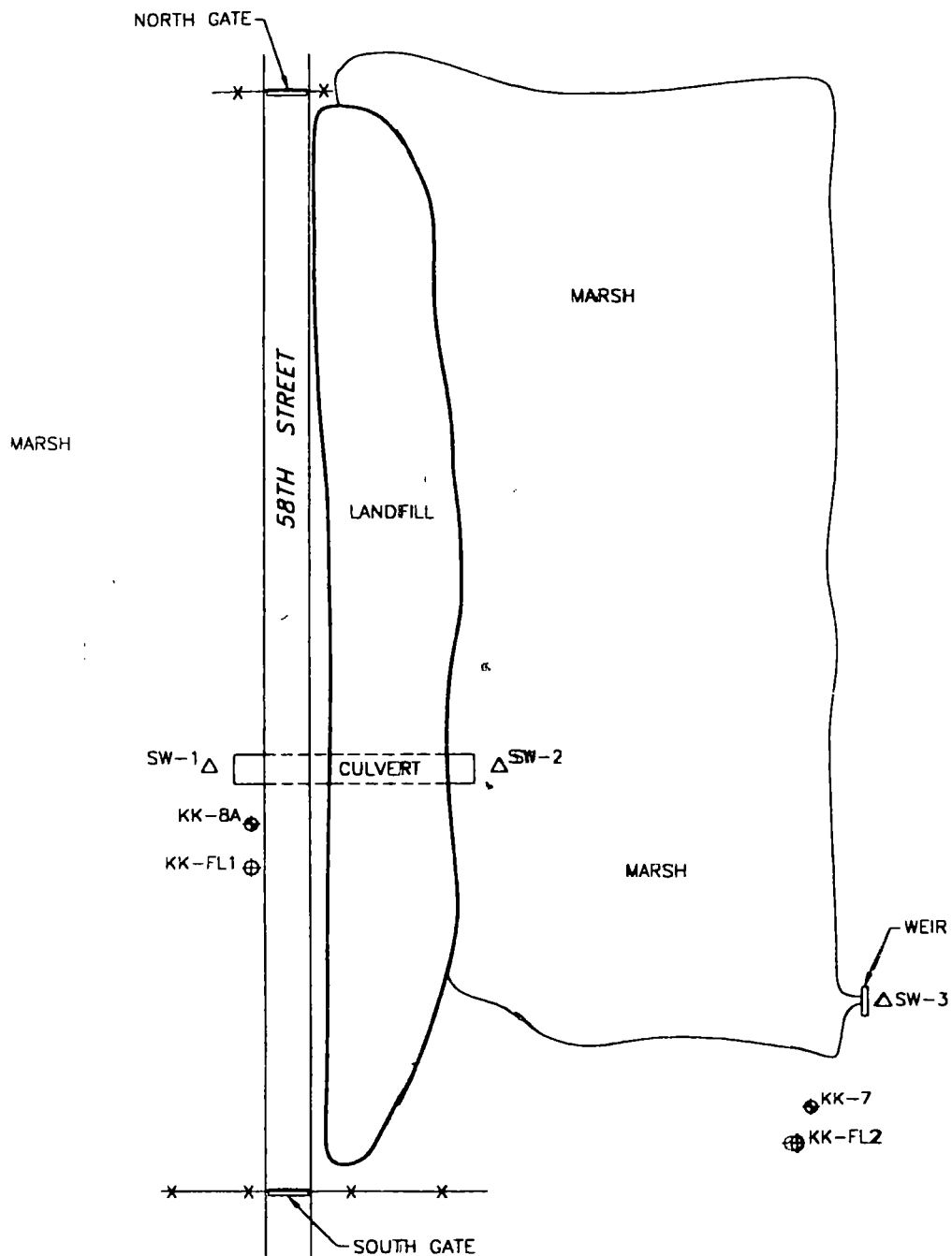


FIGURE 2
SITE LOCATION



LEGEND

- SW-1 Δ SURFACE WATER SAMPLING LOCATION AND IDENTIFICATION
- KK-7 \diamond SHALLOW MONITOR WELL LOCATION AND IDENTIFICATION
- KK-FL2 \oplus FLORIDAN AQUIFER MONITOR WELL LOCATION AND IDENTIFICATION

FIGURE 3

GULF COAST RECYCLING, INC.

SITE LAYOUT

KASSOUF-KIMERLING LANDFILL
58TH STREET
TAMPA, FLORIDA

Tables

Note: These tables were taken from the following documents:

Table 1 – Annual Water Quality Data for 1999: 1999 Report Groundwater Sampling, Surface Water Sampling, and Landfill Inspection of Kassouf-Kimerling Site, Tampa, FL prepared by Qore Property Sciences, September 3, 1999

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Table 3 – Annual Water Quality Data for 2001: 2001 Report Groundwater Sampling, Surface Water Sampling, and Landfill Inspection of Kassouf-Kimerling Site, Tampa, FL prepared by Qore Property Sciences, December 12, 2001

Table 4 – Annual Water Quality Data for 2002: 2002 Report Groundwater Sampling, Surface Water Sampling, and Landfill Inspection of Kassouf-Kimerling Site, Tampa, FL prepared by Qore Property Sciences, June 20, 2002

Gulf Coast Recycling, Inc
August 12, 1999

TABLE 1
ANNUAL WATER QUALITY DATA
FEBRUARY 18, 1999, APRIL 19, 1999, MAY 20, 1999, AND JULY 16, 1999
KASSOUF-KIMERLING LANDFILL
FOR
GULF COAST RECYCLING, INC.

SAMPLE	TIME	GROUND WATER ELEVATION (ft NGVD)	pH	TEMP C	SPECIFIC CONDUCTANCE (mhos)	TURBIDITY (NTU)	TOTAL LEAD (mg/l)
SW-1	1115	NA	NM	NM	NM	NM	0.066
SW-2	1107	NA	NM	NM	NM	NM	0.81
SW-2 (071699)	1002	NA	6.40	30.0	220	2.2	<0.0050
SW-3	1028	NA	NM	NM	NM	NM	<0.0050
KK-8A	1555	24.36	6.06	22.0	482	0.90	<0.0050
KK-FL1	1605	23.80	7.00	22.6	541	0.80	<0.0050
KK-7	1205	22.46	6.21	29.1	309	0.70	<0.0050
KK-FL2	1500	22.55	7.69	24.3	469	7.8	0.0062

Notes:

NA = Not Applicable
NM = Not Measured
ft NGVD = Feet Above National Geodetic Vertical Datum
< = Less Than
SW-1, SW-2, and SW-3 = Surface Water Sampling Locations
KK-8A/KK-FL1 and KK-7/KK-FL2 = Shallow Well/Deep Well Pairs

Gulf Coast Recycling, Inc
August 24, 2000

TABLE 2
ANNUAL WATER QUALITY DATA
APRIL 10 and JUNE 19, 2000
KASSOUF-KIMERLING LANDFILL
FOR
GULF COAST RECYCLING, INC.

SAMPLE	TIME	TOP OF CASING ELEVATION N (ft NGVD)	GROUND WATER ELEVATION (ft NGVD)	pH	TEMP °C	SPECIFIC CONDUCTANCE (µS)	TURBIDITY (NTU)	TOTAL LEAD (mg/l)
SW-1	1212	NA	NA	NM	NM	NM	24	0.032
SW-2	1220	NA	NA	NM	NM	NM	10	0.035
SW-3	1200	NA	NA	NM	NM	NM	2.5	<0.0050
KK-8A	1103	29.08	23.28	5.76	22.8	300	1.8	<0.0050
KK-FL1	1635	29.49	22.78	7.37	21.5	488	3.3	0.012
KK-7	1220	28.73	21.34	5.95	21.8	345	2.0	<0.0050
KK-FL2	1410	29.16	21.56	6.4	22.2	528	2.2	<0.0050

Notes

NA = Not Applicable
NM = Not Measured
ft NGVD = Feet Above National Geodetic Vertical Datum
< = Less Than
SW-1, SW-2, and SW-3 = Surface Water Sampling Locations, sampled June 19, 2000
KK-8A/KK-FL1 and KK-7/KK-FL2 = Shallow Well/Deep Well Pairs, sampled April 10, 2000

TABLE 3
ANNUAL WATER QUALITY DATA - 2001
KASSOUF-KIMERLING LANDFILL
FOR
GULF COAST RECYCLING, INC

SAMPLE	DATE/ TIME	TOP OF CASING ELEVATION (ft NGVD)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION (ft NGVD)	pH	TEMP °C	SPECIFIC CONDUCTANCE (µS)	TURBIDITY (NTU)	TOTAL LEAD (mg/l)
SW-1	April 16, 2001/1550	NA	NA	NA	5.82	23.6	394	90	<0.0050
SW-2	April 16, 2001/1540	NA	NA	NA	5.22	24.8	417	120	0.047
SW-2	August 20, 2001/1250	NA	NA	NA	6.92	31.6	418	2.5	<0.0050
SW-3	April 16, 2001/1515	NA	NA	NA	6.88	27.4	458	0	<0.0050
KK-8A	April 16, 2001/1150	29.08	5.92	23.16	5.77	22.5	489	0.35	<0.0050
KK-FL1	April 16, 2001/1227	29.49	6.53	22.96	6.56	24.3	466	0	<0.0050
KK-7	April 16, 2001/1400	28.73	6.71	22.02	5.45	21.2	506	0	<0.0050
KK-FL2	April 16, 2001/1405	29.16	6.98	22.18	6.25	23.4	461	0	<0.0050

Notes.

NA = Not Applicable

NM = Not Measured

ft NGVD = Feet Above National Geodetic Vertical Datum

< = Less Than

SW-1, SW-2, and SW-3 = Surface Water Sampling Locations, sampled April 16, 2001 and August 20, 2001

KK-8A/KK-FL1 and KK-7/KK-FL2 = Shallow Well/Deep Well Pairs, sampled April 16, 2001

TABLE 4
ANNUAL WATER QUALITY DATA - 2002
KASSOUF-KIMERLING LANDFILL
FOR
GULF COAST RECYCLING, INC

SAMPLE	DATE	TOP OF CASING ELEVATION (ft NGVD)	DEPTH TO WATER (feet)	GROUND WATER ELEVATION (ft NGVD)	pH	TEMP °C	SPECIFIC CONDUCTANCE (µS)	TURBIDITY (NTU)	HARDNESS* (mg/l)	TOTAL LEAD (mg/l)
SW-1	May 10, 2002	NA	NA	NA	6.47	24.0	438	3.2	190	<0.0050
SW-2	May 10, 2002	NA	NA	NA	6.54	24.2	435	0.5	180	<0.0050
SW-3	May 10, 2002	NA	NA	NA	6.32	25.5	444	0.7	180	0.019
AW	May 21, 2002	NM	NM	NA	NM	NM	NM	NM	190	NM
KK-8A	May 10, 2002	29.08	5.57	23.51	5.79	23.3	478	0.75	NM	<0.0050
KK-FL1	May 10, 2002	29.49	6.44	23.05	6.71	23.7	435	0	NM	<0.0050
KK-7	May 10, 2002	28.73	6.89	21.84	5.42	22.2	536	0.15	NM	<0.0050
KK-FL2	May 10, 2002	29.16	7.30	21.86	6.48	23.9	436	0	NM	<0.0050

Notes

NA = Not Applicable

NM = Not Measured

ft NGVD = Feet Above National Geodetic Vertical Datum

< = Less Than

* Samples collected on May 21, 2002

**Photographs
of
Kassouf-Kimerling Superfund Site**



Photo #1. Kassouf-Kimerling Superfund Site - South Gate



Photo #2. Kassouf-Kimerling Superfund Site - Looking South at grassy cap



Photo #3. Kassouf-Kimerling Superfund Site - Looking East at drain under cap



Photo #4. Kassouf-Kimerling Superfund Site - Groundwater monitoring wells, looking West



Photo #5. Kassouf-Kimerling Superfund Site - North Gate

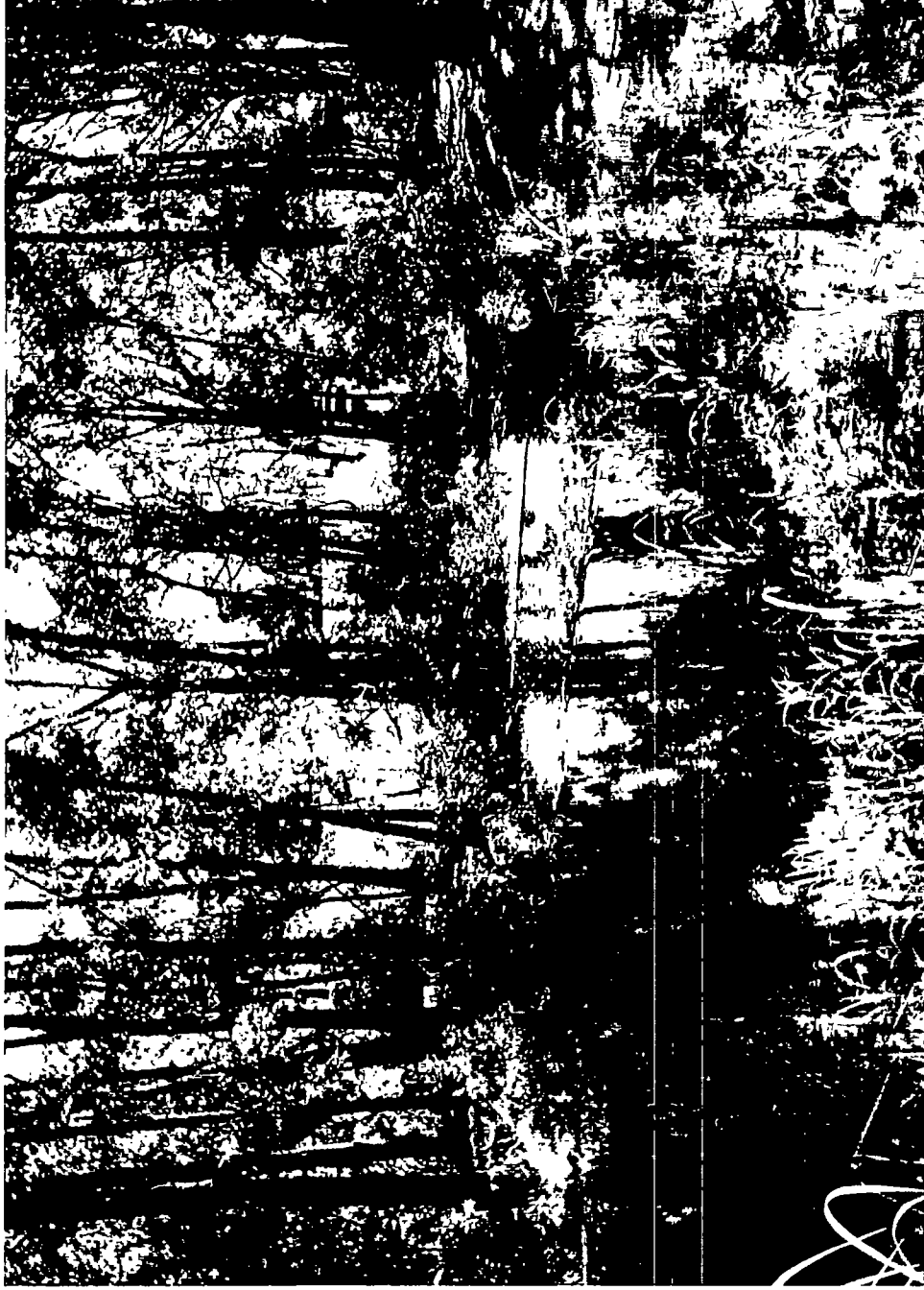


Photo. #6. Kassouf-Kimerling Superfund Site - Palm River flowing Southeast adjacent to site

Attachment A

Documents Reviewed

Reports and Memorandums

- 1999 Report Groundwater Sampling, Surface Water Sampling, and Landfill Inspection of Kassouf-Kimerling Site, Tampa, FL prepared by Qore Property Sciences, (September 3, 1999)
- 2000 Report Groundwater Sampling, Surface Water Sampling, and Landfill Inspection of Kassouf-Kimerling Site, Tampa, FL prepared by Qore Property Sciences, (August 24, 2000)
- 2001 Report Groundwater Sampling, Surface Water Sampling, and Landfill Inspection of Kassouf-Kimerling Site, Tampa, FL prepared by Qore Property Sciences, (December 12, 2001)
- 2002 Report Groundwater Sampling, Surface Water Sampling, and Landfill Inspection of Kassouf-Kimerling Site, Tampa, FL prepared by Qore Property Sciences, (June 20, 2002)
- Operational And Maintenance Plan For The Kassouf-Kimerling Battery Disposal Site Tampa, Hillsborough County, Florida, Prepared by OHM Remediation Services Corp and Dames & Moore, Inc (February 26, 1993)
- Superfund Preliminary Closeout Report, Kassouf-Kimerling Superfund Site, Tampa, Hillsborough County, Florida, (September 24, 1998)
- Quarterly/Storm Event Inspection Reports, Kassouf-Kimerling Superfund Site (February 1999-March 2004)
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Attachment B

Site Inspection Checklist

Five-Year Review Site Inspection Checklist

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(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable")

I. SITE INFORMATION	
Site name: Kassouf Kimlering Superfund Site	Date of inspection: 05/06/2004
Location and Region: Hillsborough County, FL R-4	EPA ID: FLD980727820
Agency, office, or company leading the five-year review: USACE, Jacksonville District	Weather/temperature: Sunny, 85 degrees F
Remedy Includes (Check all that apply) <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 45%;"> <input checked="" type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Access controls <input type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____ </div> <div style="width: 45%;"> <input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls </div> </div>	
Attachments: <input checked="" type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached	
II. INTERVIEWS (Check all that apply)	
1 O&M site manager _Joyce Morales-Caramella_ _Environmental Manager_ _05/06/2004_ <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%;">Name</div> <div style="width: 30%;">Title</div> <div style="width: 30%;">Date</div> </div> Interviewed <input checked="" type="checkbox"/> at site <input checked="" type="checkbox"/> at office <input type="checkbox"/> by phone Phone no _813-626-6151_ <div style="margin-top: 5px;"> Problems, suggestions, <input type="checkbox"/> Report attached <input type="checkbox"/> No major problems _____ </div>	
2 O&M staff _____ <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 30%;">Name</div> <div style="width: 30%;">Title</div> <div style="width: 30%;">Date</div> </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no _____ <div style="margin-top: 5px;"> Problems, suggestions, <input type="checkbox"/> Report attached _____ </div>	

3	Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.			
Agency _____ Contact _____ <div style="display: flex; justify-content: space-between; width: 100%;"> Name Title Date Phone no </div> Problems, suggestions, ___ Report attached _____				
Agency _____ Contact _____ <div style="display: flex; justify-content: space-between; width: 100%;"> Name Title Date Phone no </div> Problems, suggestions, ___ Report attached _____				
Agency _____ Contact _____ <div style="display: flex; justify-content: space-between; width: 100%;"> Name Title Date Phone no </div> Problems, suggestions, ___ Report attached _____				
Agency _____ Contact _____ <div style="display: flex; justify-content: space-between; width: 100%;"> Name Title Date Phone no </div> Problems, suggestions, ___ Report attached _____				
4	Other interviews (optional) ___ Report attached			

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1	O&M Documents <input type="checkbox"/> O&M manuals <input type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
2	Site-Specific Health and Safety Plan <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input type="checkbox"/> N/A
3	O&M and OSHA Training Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
4	Permits and Service Agreements <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5	Gas Generation Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
6	Settlement Monument Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
7	Groundwater Monitoring Records Remarks _____	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> N/A
8	Leachate Extraction Records Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9	Discharge Compliance Records <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
10	Daily Access/Security Logs Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A

IV. O&M COSTS																																																															
1	O&M Organization <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> State in-house <input type="checkbox"/> PRP in-house <input type="checkbox"/> Federal Facility in-house <input type="checkbox"/> Other <u>Qore Property Sciences, 1211 Tech Blvd , Suite 200, Tampa ,FL</u> </div> <div> <input type="checkbox"/> Contractor for State <input type="checkbox"/> Contractor for PRP <input type="checkbox"/> Contractor for Federal Facility </div> </div>																																																														
2	O&M Cost Records <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> Funding mechanism/agreement in place Original O&M cost estimate _____ Breakdown attached <div style="text-align: center;">Total annual cost by year for review period if available</div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">From _____</td> <td style="width: 10%;">To _____</td> <td style="width: 20%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 20%;">_____ Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td></td> <td style="text-align: center;">Total cost</td> <td></td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td></td> <td>_____ Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td></td> <td style="text-align: center;">Total cost</td> <td></td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td></td> <td>_____ Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td></td> <td style="text-align: center;">Total cost</td> <td></td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td></td> <td>_____ Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td></td> <td style="text-align: center;">Total cost</td> <td></td> <td></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td></td> <td>_____ Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td></td> <td style="text-align: center;">Total cost</td> <td></td> <td></td> </tr> </table>			From _____	To _____				_____ Breakdown attached	Date	Date		Total cost			From _____	To _____				_____ Breakdown attached	Date	Date		Total cost			From _____	To _____				_____ Breakdown attached	Date	Date		Total cost			From _____	To _____				_____ Breakdown attached	Date	Date		Total cost			From _____	To _____				_____ Breakdown attached	Date	Date		Total cost		
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Date	Date		Total cost																																																												
3	Unanticipated or Unusually High O&M Costs During Review Period Describe costs and reasons none reported _____ _____ _____ _____ _____ _____																																																														
V. ACCESS AND INSTITUTIONAL CONTROLS <input type="checkbox"/> Applicable <input type="checkbox"/> N/A																																																															
A. Fencing																																																															
1	Fencing damaged <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Gates secured <input type="checkbox"/> N/A Remarks <input type="checkbox"/> Fencing in good shape _____ _____ _____																																																														
B. Other Access Restrictions																																																															
1	Signs and other security measures <input checked="" type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A Remarks _____ _____ _____																																																														

C. Institutional Controls (ICs)				
1	Implementation and enforcement Site conditions imply ICs not properly implemented ___ Yes ___ No <u>_x_</u> N/A Site conditions imply ICs not being fully enforced ___ Yes ___ No <u>_x_</u> N/A Type of monitoring (e g , self-reporting, drive by) _____ Frequency _____ Responsible party/agency _____ Contact _____ <div style="display: flex; justify-content: space-between; margin-top: 10px;"> Name Title Date Phone no </div> Reporting is up-to-date ___ Yes ___ No <u>_x_</u> N/A Reports are verified by the lead agency ___ Yes ___ No <u>_x_</u> N/A Specific requirements in deed or decision documents have been met ___ Yes ___ No <u>_x_</u> N/A Violations have been reported ___ Yes ___ No <u>_x_</u> N/A Other problems or suggestions ___ Report attached _____ _____ _____			
2	Adequacy ___ ICs are adequate ___ ICs are inadequate ___x_ N/A Remarks _____ _____ _____			
D. General				
1	Vandalism/trespassing ___ Location shown on site map ___x_ No vandalism evident Remarks _____ _____			
2	Land use changes on site ___x_ N/A Remarks _____ _____			
3	Land use changes off site ___x_ N/A Remarks _____ _____			
VI. GENERAL SITE CONDITIONS				
A. Roads ___ Applicable ___x_ N/A				
1	Roads damaged ___ Location shown on site map ___ Roads adequate ___x_ N/A Remarks _____ _____			

B. Other Site Conditions			
Remarks _____ _____ _____ _____ _____			
VII. LANDFILL COVERS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
A. Landfill Surface			
1	Settlement (Low spots) Areal extent _____ Remarks _____	____ Location shown on site map Depth _____	<input checked="" type="checkbox"/> Settlement not evident
2	Cracks Lengths _____ Remarks _____	____ Location shown on site map Widths _____ Depths _____	<input checked="" type="checkbox"/> Cracking not evident
3	Erosion Areal extent _____ Remarks _____	____ Location shown on site map Depth _____	<input checked="" type="checkbox"/> Erosion not evident
4	Holes Areal extent _____ Remarks _____	____ Location shown on site map Depth _____	<input checked="" type="checkbox"/> Holes not evident
5	Vegetative Cover <input checked="" type="checkbox"/> Grass <input checked="" type="checkbox"/> Cover properly established <input type="checkbox"/> No signs of stress ____ Trees/Shrubs (indicate size and locations on a diagram) Remarks _____		
6	Alternative Cover (armored rock, concrete, etc.) <input checked="" type="checkbox"/> N/A Remarks _____		
7	Bulges Areal extent _____ Remarks _____	____ Location shown on site map Height _____	<input checked="" type="checkbox"/> Bulges not evident

8	Wet Areas/Water Damage <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____	<input checked="" type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map	Areal extent _____ Areal extent _____ Areal extent _____ Areal extent _____
9	Slope Instability Areal extent _____ Remarks _____	<input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of slope instability
B. Benches <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel)			
1	Flows Bypass Bench Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
2	Bench Breached Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
3	Bench Overtopped Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
C. Letdown Channels <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies)			
1	Settlement Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input checked="" type="checkbox"/> No evidence of settlement
2	Material Degradation Material type _____ Remarks _____	<input type="checkbox"/> Location shown on site map Areal extent _____	<input checked="" type="checkbox"/> No evidence of degradation
3	Erosion Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input checked="" type="checkbox"/> No evidence of erosion

4	Undercutting <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of undercutting Areal extent _____ Depth _____ Remarks _____
5	Obstructions Type _____ <input checked="" type="checkbox"/> No obstructions <input type="checkbox"/> Location shown on site map Areal extent _____ Size _____ Remarks _____
6	Excessive Vegetative Growth Type _____ <input checked="" type="checkbox"/> No evidence of excessive growth <input type="checkbox"/> Vegetation in channels does not obstruct flow <input type="checkbox"/> Location shown on site map Areal extent _____ Remarks _____
D. Cover Penetrations <input type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1	Gas Vents <input type="checkbox"/> Active <input type="checkbox"/> Passive <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____
2	Gas Monitoring Probes <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____
3	Monitoring Wells (within surface area of landfill) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____
4	Leachate Extraction Wells <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____
5	Settlement Monuments <input type="checkbox"/> Located <input type="checkbox"/> Routinely surveyed <input checked="" type="checkbox"/> N/A Remarks _____

E. Gas Collection and Treatment <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1	Gas Treatment Facilities <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
2	Gas Collection Wells, Manifolds and Piping <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____	
3	Gas Monitoring Facilities (e g , gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____	
F. Cover Drainage Layer <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1	Outlet Pipes Inspected <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A Remarks _____ _____	
2	Outlet Rock Inspected <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A Remarks _____ _____	
G. Detention/Sedimentation Ponds <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1	Siltation Areal extent _____ Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____	
2	Erosion Areal extent _____ Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____	
3	Outlet Works <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	
4.	Dam <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____	

H. Retaining Walls		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1	Deformations <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Deformation not evident Horizontal displacement _____ Vertical displacement _____ Rotational displacement _____ Remarks _____		
2	Degradation <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Degradation not evident Remarks _____		
I. Perimeter Ditches/Off-Site Discharge		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1	Siltation <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Siltation not evident Areal extent _____ Depth _____ Remarks _____		
2	Vegetative Growth <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A <input type="checkbox"/> Vegetation does not impede flow Areal extent _____ Type _____ Remarks _____		
3	Erosion <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Erosion not evident Areal extent _____ Depth _____ Remarks _____		
4	Discharge Structure <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____		
VIII. VERTICAL BARRIER WALLS		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1	Settlement <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident Areal extent _____ Depth _____ Remarks _____		
2	Performance Monitoring Type of monitoring _____ <input type="checkbox"/> Performance not monitored Frequency _____ Evidence of breaching _____ Head differential _____ Remarks _____		

IX. GROUNDWATER/SURFACE WATER REMEDIES <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1	Pumps, Wellhead Plumbing, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____
2	Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
B. Surface Water Collection Structures, Pumps, and Pipelines <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1	Collection Structures, Pumps, and Electrical <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3	Spare Parts and Equipment <input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

C. Treatment System <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1	Treatment Train (Check components that apply) <input type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters _____ <input type="checkbox"/> Additive (e g , chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks _____ _____		
2	Electrical Enclosures and Panels (properly rated and functional) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
3	Tanks, Vaults, Storage Vessels <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
4	Discharge Structure and Appurtenances <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
5	Treatment Building(s) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks _____ _____		
6	Monitoring Wells (pump and treatment remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____		
D. Monitoring Data			
1	Monitoring Data <input checked="" type="checkbox"/> Is routinely submitted on time <input type="checkbox"/> Is of acceptable quality		
2	Monitoring data suggests <input checked="" type="checkbox"/> Groundwater plume is effectively contained <input type="checkbox"/> Contaminant concentrations are declining		

D. Monitored Natural Attenuation			
1	Monitoring Wells (natural attenuation remedy)		
	<input checked="" type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> Good condition <input type="checkbox"/> N/A
Remarks _____ _____			
X. OTHER REMEDIES			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy An example would be soil vapor extraction			
XI. OVERALL OBSERVATIONS			
A.	Implementation of the Remedy		
	Describe issues and observations relating to whether the remedy is effective and functioning as designed Begin with a brief statement of what the remedy is to accomplish (i e , to contain contaminant plume, minimize infiltration and gas emission, etc) <input type="checkbox"/> The remedy is intended to reduce infiltration into the solidified/stabilized waste and contaminated soils by a low permeability top cover. The remedy appears to be effective and to be functioning as designed. _____ _____ _____ _____ _____ _____ _____ _____ _____ _____		
B.	Adequacy of O&M		

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

All monitoring wells are intact and accessible. Mowing frequency should be as needed to prevent buildup of clippings. Pumps and piping are operating effectively.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

No indicators of potential remedy failure were observed during the site visit.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Other than more restricting access to the site, the remedy which has been completed requires very little maintenance and has minimal operating costs.